REMARKS/ARGUMENTS

Reconsideration is respectfully requested of the Official Action of January 26, 2004, relating to the above-identified application.

A request for a three month extension of time, together with the associated fee is filed herewith.

The claims in the case are: 1, 2, 4, 6, 7, 9-21 and 23-27.

Claim 1 has been further amended to specify that the process for directly spraying the surface to be protected with a zinc or zinc-based alloy is produced by an electric arc, twin wire thermal spray process wherein one wire is a zinc wire and the second wire is zinc or zinc alloy. Basis is found in the specification at pg. 6, line 28, and pg. 7, line 26. Claims 7 and 13, as well as Claim 19, have been similarly amended. Claim 19 additionally specifies that at least one wire is 100% zinc. Claims 24-27 are presented to particularly point out and distinctly claim more particular features of the present invention. Thus, Claim 24 specifies that the second wire is also 100% zinc. Claims 25 and 26 specify that the marine surface is a propeller, while Claim 27 specifies that the second wire is a zinc-copper alloy. No new matter is presented.

The rejection of Claims 1, 2, 13-16 and 18, under 35 U.S.C. § 102(b) as anticipated by the article entitled "The Application of Zn-Al Coatings to Prevent Corrosion of an Iron Boat", is traversed and reconsideration is respectfully requested.

The reference in the Official Action is a document that was presented at the International Thermal Spray Conference & Exhibition in Orlando, Florida, in 1992, and discloses several procedures which are said to result in protection of iron or steel structures in a marine environment. The flow diagram in Fig. 2, on page 1 of the article, shows a series of steps

including a check of the boat, a degreasing operation, a blast cleaning operation for removal of rust and scale, the application of a very specific zinc-aluminum coating; namely, 87% Zn and 13% Al, followed by a sealing step and then finally a painting step. The system of the reference appears to require some sort of protective coating applied on top of the 87:13 zinc-aluminum coating. Thus, the systems of treatment shown in Table 1, on pg. 2, indicate, for example, that a chlorinated rubber paint is applied after the zinc-aluminum spray or, as shown in Table 6, a zinc-rich paint is applied after the zinc-aluminum spray coating. The spray system disclosed in the article is a flame spray using a zinc-aluminum wire composed of 87% zinc and 13% aluminum as shown in col. 2, on pg. 1 of the article.

In contrast, applicant's' invention, as defined in the claims, concerns a method for protecting a submerged or partially submerged surface from biofouling and corrosion without external electrical power which is carried out by directly spraying a surface with an electric arc, twin wire thermal spray process, wherein at least one wire is zinc and the second wire is zinc or a zinc-alloy to form a protective coating. Applicant's system of using the electric arc, twin wire thermal spray process is not disclosed in the cited article and, consequently, the article fails as an anticipation of the claims. Therefore, the rejection should be withdrawn.

With respect to those claims which recite the method as applied to a propeller, it should be noted the article does not disclose applying any type of coating to a propeller. Propellers in marine service are subjected to extremely severe conditions which make them particularly vulnerable to corrosion and fouling. Applicant's invention has proven to be particularly suitable for protection of propellers. The article fails to anticipate the subject matter of the present invention which relates to the treatment of propellers; namely, Claims 17, 25 and 26..

The rejection of Claims 1, 2, 6, 13-16 and 18, as anticipated under 35 U.S.C. § 102(b), in view of *Goldheim* (US 3,097,932), is traversed and reconsideration is respectfully requested. *Goldheim*, a 1963 patent, relates to anti-fouling coatings for submerged marine objects, such as boat and ship hulls. The patent teaches a flame spray process for depositing zinc and an alloy of mercury and zinc to impregnate the pores of the zinc. In other words, first a flame sprayed porous zinc metal coating is applied and, after that, an alloy of zinc and mercury metal is coated in order to cover the pores of the zinc metal coating. Nothing in this document discloses applicant's method of spraying using an electric arc, twin wire thermal spray process wherein one wire is a zinc wire and a second wire is zinc or zinc alloy.

Neither is there any disclosure in the reference of the special problems dealing with protection of propellers. Consequently, applicant respectfully submit that the reference does not anticipate the claimed subject matter and, therefore, the rejection is improper and should be withdrawn.

The rejection of Claims 4, 7, 9-12, 17, 19, 20 and 23, under 35 U.S.C. § 103(a), in view of the Zn-Al article, is traversed and reconsideration is respectfully requested. The Official Action, on pg. 6, concludes with respect to the alleged obviousness of the claimed invention in the face of the Zn-Al article, that it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the conditions that are described in the Zn-Al article in a variety of ways. For example, the Official Action (pg. 7) alleges that it would have been obvious to spray multiple layers to achieve the desired coating thickness with the expectation of achieving the desired coated product. The Official Action makes reference to pg. 877 (first page of the article). However, there is nothing in this article which would suggest that

multiple spraying applications would be superior to a single application; and, indeed, with respect to the thickness of the sprayed parts, on pg. 878, the article alleges "The thickness did not change significantly on sprayed and sealed parts exposed to the atmosphere. As the term of test was short, it is necessary to continue to test to define the advantages of metal spraying." This shows that the authors of the article were not certain as to what the effective thickness should be, and certainly did not teach that multiple applications of the layer would achieve an improvement in the coating and in the protection of the underlying metal surface.

Still further, the Official Action (pg. 7) alleges that it would be obvious:

> "...to modify Zn-Al article to (4) optimize the amount of Zn in the coating based on the specific substrate used so as to achieve the optimum final product protection, because Zn-Al article teaches a test of a specific example of Zn-Al, and further indicates (at page 880) that further investigation is to be performed, indicating the desire to optimize the specific coating used."

However, there is no teaching in the reference of any specific coating other than the use of a zinc aluminum wire containing 87% zinc and 13% aluminum as set forth on pg. 877 of the article. Moreover, there is no teaching or suggestion as to how the proportions of zinc be changed. In other words, should Zn be increased or decreased to achieve "optimum" results. Hence, the Examiner's allegation that it would be obvious to "optimize" finds no basis in the disclosure of the reference. There is simply no reason or motivation for a person skilled in the art to change any of the conditions disclosed in the article with the expectation to achieve improved results.

The Official Action further alleges:

"It would further have been obvious to modify Zn-Al article to (5) apply the coating system to a propeller so as to produce a protected propeller, because Zn-Al

article teaches a coating to prevent corrosion and fouling, and propellers would be a marine surface that would be desirable to protect from corrosion and fouling so as to prolong their useful economic life." (See, pg. 7).

It is well known in the industry thatpropellers are subjected to very severe conditions and it could not be assumed that coatings which would suffice on a ship hull would also suffice to protect a propeller. Hence, in the absence of any teaching that such coatings are suitable for propellers, the article fails to suggest to a person skilled in the art that the same coatings applied to the hull can be applied with the expectation of achieving good results on propellers. It is respectfully submitted that the Official Action fails to provide sufficient reason, suggestion or motivation whereby a person skilled in the art would be lead to use these coatings to protect propellers with the expectation of achieving good results.

Finally, it should be noted that there is no teaching, suggestion or motivation in the article to use an electric arc, twin wire thermal spray process where one wire is a zinc wire and a second wire is zinc or zinc alloy such as zinc-copper with the expectation of achieving good results. Consequently, applicant respectfully submits that the rejection of the claims as allegedly obvious in view of the Zn-Al article is not well considered and should be withdrawn.

The rejection of Claims 6 and 21, under 35 U.S.C. § 103(a), as unpatentable over the Zn-Al article as applied to the previous claims and further in view of *Goldheim* is traversed and reconsideration is respectfully requested. All of the comments made above with respect to the Zn-Al article, as well as the *Goldheim* patent, apply here as well. Applicant respectfully submits there is no motivation, suggestion or teaching in the references, either individually or in combination, which would suggest the presently claimed process which requires the use of an electric arc, twin wire thermal spray process. Consequently, since the references fail to disclose

a critical feature of the claimed invention, applicant respectfully submits that the rejection is without proper foundation and should be withdrawn.

The rejection of Claim 22, under 35 U.S.C. § 103(a) as unpatentable over the Zn-Al article, further in view of *Pedeutour* (US 5,706,866), is believed to be moot with the cancellation of Claim 22. However, applicant would point out that there would be no motivation, suggestion or reason to modify the system in the Zn-Al article to include an electric arc, twin wire thermal spray process because the subject matter of *Pedeutour* relates to a completely non-analogous technology; namely, the coating of buried piping. Persons skilled in the art having been face-to-face with the problems caused by a marine environment would not be lead to look to technology relating to the protection of buried pipes for a solution to the problem.

The rejection of Claims 4, 10 and 17 under 35 U.S.C. § 103(a) as unpatentable over the *Goldheim* patent is traversed and reconsideration is respectfully requested. *Goldheim* fails to teach, suggest or motivate any person skilled in the art to use an electric arc, twin wire thermal spray process wherein one wire is a zinc wire and a second wire is zinc or zinc alloy in order to obtain a protective coating of zinc or zinc-based alloy on marine surfaces to provide protection to those surfaces. *Goldheim*'s teaching is to use a flame spray to deposit zinc metal as the first coating and then a second coating of zinc and mercury to fill in the pores of the zinc metal. There is no teaching in the record of any equivalency or interchangeability in these twin techniques and, therefore, it is believed that the rejection fails to make out a case of *prima facie* obviousness of the claimed invention.

For reasons set forth above, applicant respectfully submits that the application is in proper condition for allowance and, therefore, favorable action at the Examiner's earliest convenience is respectfully requested.

Respectfully submitted,

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